

PROCEEDINGS
OF THE
ROYAL SOCIETY OF EDINBURGH.

VOL. V.

1862-63.

No. 59.

EIGHTIETH SESSION.

Monday, 24th November 1862.

Dr CHRISTISON, V.P., in the Chair.

The following Council were elected :—

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HIS GRACE THE DUKE OF ARGYLL, K.T.

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VOL. V.

A

Monday, 1st December 1862.

Principal Forbes, one of the Vice-Presidents, delivered the following Opening Address :—

GENTLEMEN,—I propose to address you on this occasion with reference to the following points :—

First, to recapitulate briefly the origin, the objects, and the Constitution of Societies similar to our own.

Secondly, to trace the rise and general history of the Royal Society of Edinburgh.

Thirdly, to consider what changes the progress of science and of society render necessary or desirable in the working of associations like ours, and how far such changes are safe and prudent.

Lastly, to recall the history of this Society during the past twelve months, especially with reference to the Fellows whom it has lost.

I. To recapitulate briefly the Origin, Objects, and Constitution of Societies similar to our own.

Societies having any true analogy to the academies of modern Europe, or to the Royal Societies of London and Edinburgh, or the Royal Irish Academy, have arisen within about 300 years. Italy was their birth-place, and perhaps, on the whole, in no country have they flourished more. They appear to have been the direct offspring of the spirit of inquiry so active in that country throughout the sixteenth and seventeenth centuries. According to the literary historians of Italy, the cultivation of literature by academicians, salaried by the Government, commenced at Rome in 1514, under the Pontificate of Leo X. It is well known, that the cultivation of literature and the fine arts continued to be fostered in Italy by similar institutions during many generations. The *Accademia della Crusca* (named after the Italian word for bran or chaff, from the fanciful analogy of sifting the pure from the heterogeneous parts of the language), and the Society of Arcadians, which still

exists or existed lately, are familiar examples. But the number of such associations was vastly greater than we can find a parallel for in other countries or in more recent times.

After all, the typical form of the modern Royal Society or Academy is traceable to the astonishing impulse given to the experimental physical sciences in Italy in the sixteenth century. The first such society recorded by Tiraboschi and Libri, the chief annalists of the revival of letters in Italy, was called "*Accademia Secretorum Naturæ*," founded at Naples in 1560, of which the celebrated Baptista Porta was president. It was suppressed, however, by the influence of the priests. The Society of *Lincei*, or Lynx-eyed scrutators into natural phenomena, of which Galileo was a member, held its sittings at Rome. It was founded in 1604 by Cesi, a noble Roman, and still survives, though after a long intervening period of inactivity.*

It is easy to see how the newly born interest of mankind in the investigation of nature by experiment, must, far more than mere literary discussion or dialectical argument, have fostered such associations. In those glorious days when a virgin mine of natural phenomena was first opened to the intelligent exploration of mankind, the succession of inventions, discoveries, and capital theories in physical science, kept every thoughtful mind on the stretch. The comparatively recent art of printing served to disseminate rapidly both facts and doctrines; the promulgation of the true system of the world by Copernicus, the improved astronomical observations of Tycho, the mechanics of Da Vinci and Stevinus, the telescope of Galileo, kept all Europe in a tremble of expectation for the discoveries of each succeeding year. What *could* men do in such circumstances but assemble with others like-minded, and see with their own eyes the facts which seemed to contradict the experience or prepossessions of ages, and either maintain or overthrow the new philosophy? It was under such circumstances that the Florentine Academy, "*del Cimento*" was founded in 1657,† under the patronage of the Grand Duke Ferdinand II. of Tuscany, and with the personal support of his brother Leopold. The withdrawal

* See Drinkwater Bethune's *Life of Galileo*, p. 37.

† First meeting, 18th June 1657. *Saggi*, &c., Edit. 1841; Introd. p. 95. As its name imports it was an association for making *experiments*.

of the latter from Florence in 1667, on being made a Cardinal, was followed by the decline and virtual extinction of this remarkable Society. This is considered by Mr Hallam as a proof of the inconveniences attending such exalted patronage of literary societies; yet it does not seem to afford a sufficient reason for the cessation of the labours of a society which gave such indisputable proofs of vigour, whose Transactions remain a book of reference to this day, and whose members, including the best and ablest pupils of Galileo, were well able to sustain their position amongst the learned men of Europe.

The wide reputation of the Florentine Essays contributed, no doubt, to the establishment—also under Royal sanction—of the Royal Society of London. This took place in November 1660, immediately after the Restoration, and from that time their proceedings may be traced with minute precision. Founded originally upon the basis of a private Society for the cultivation of Natural and Experimental Science instituted in 1645, it was incorporated by charter in 1662, four years before the Academy of Sciences of Paris was instituted in 1666 under the auspices of Colbert. This last was incorporated with the previously existing *Académie Française* founded for the cultivation of the French Language and Literature, much after the manner of the Crusca Academy in Italy.

The Academy of Sciences and the Royal Society of London subsist, it is needless to say, to this day; and each in their own sphere, and in varying ways, according to the exigencies of the time, have contributed in the most important way to the improvement of the Physical and Mathematical Sciences. The unbroken series of Transactions of both are without a parallel in the history of knowledge for continuity and importance. The publication of the "Philosophical Transactions" commenced in monthly numbers on the 1st March 1665. Our own Society has very recently acquired for the first time a complete set of these publications from the commencement,—an acquisition of some difficulty and importance.

An hundred and twenty years elapsed before the progress of knowledge and of organisation in the sister kingdoms of Scotland and Ireland sufficed for the formal institution of associations on similar principles and with similar ends to the Royal Society. The

Royal Society of Edinburgh was formally constituted in 1783, and that of Dublin, or the Royal Irish Academy, in 1785. Both arose out of societies previously existing, though of a more private character, and not incorporated. As most interesting to us, I shall presently proceed to trace the rise of the Royal Society of Edinburgh.

But before giving an account of this, let me interpose a remark on the organisation of such societies generally. Even in early times, they differed from one another in respect of being either under the direct influence of the State, or of being merely private associations. This distinction continues to the present day. The French Academies, for example, are national institutions, and the members receive salaries from public funds. The Royal Societies of this country, on the other hand, are free from even the vestige of State control, and pursue their aims without pecuniary objects, and according to their own regulations. This is not the place to discuss the advantage of the two systems, in favour of each of which something may be said. The place of a salaried academician is often really desirable for those whose fortunes do not enable them to pursue the unremunerative paths of science and literature. On the other hand, the pecuniary gain is liable to give rise to motives less pure than mere honorary distinctions can do, on the part both of candidates for the post and of the academical electors. It appears from the history of the *Académie Française* in its origin, that the enlargement and incorporation of it under the State influence of Cardinal Richelieu was much resented by its original members.

The two forms of constitutions—the one creating a power in the State with corresponding advantages to its associates, the other receiving an impulse entirely from within—are really so distinct, that it seems almost invidious to compare them. The latter appears, from the history of our country, to be most congenial to English habits in such matters; and perhaps we have no great reason to regret the absence of an “Institute” under Imperial or Royal administration.

But another question arises with reference to such Societies as those of London, Edinburgh, and Dublin: Whether, in default of substantial endowments in connection with membership, an arti-

ficial standard of literary and scientific distinction is to be held up as regulating the entrance or refusal of candidates?—whether, in short, the members of our Societies are to be held as unsalaried academicians,—men selected for intellectual attainment alone, and forming therefore a learned class?

On this point, which is one of considerable importance, I confess that I entertain little doubt. Whatever disadvantages may attend the admission to Societies like this of persons who have no pretensions to what, for convenience, one may call a *professional* acquaintance with science, art, or literature, I think that they ought to be eligible. It is little likely that where no emoluments or distinctions present themselves, the privilege of membership will be sought except by those who feel *some* sympathy with pursuits for which they have probably a secret leaning, but from which they have been withheld by force of circumstances. I say, Let them come, and freely, and let us regard their adhesion to our ranks as a compliment on either side.

In Britain, all experience points to this resolution of what may be in some respects regarded as a difficulty. From the day of the foundation of the Royal Societies, both of London and Edinburgh, the rule of mixture of classes, and the absence of an academic standard of exclusion, has been all but universal. The co-operation of men of all ranks, and of the most varied occupations and acquirements, was the very corner-stone of these institutions. While they diffused a taste for science amongst the nobility, gentry, and professional men, this very mixture enhanced, in no small degree, the interest of the proceedings of the Societies themselves, and conducted to the respect shown to literature and science. It also indirectly aided the progress of the latter, by raising a large fund for the publication of Transactions and the conduct of experiments.

To attempt to enforce a contrary principle, would be to reduce the members of our Societies to a select few, without the advantages which academicians properly enjoy, and without the cordial sympathy which the lay-members (as they may be termed) contribute to diffuse amongst an intelligent public, whose sentiments in such matters is never to be despised.

II.—*Rise and Progress of the Royal Society of Edinburgh.*

Guided by an interesting passage in the "Life of Lord Kames,"* it would appear that the germ of our Society is to be found in the *Rankenian Club*, instituted in Edinburgh in 1716, for literary social meetings, and which had the unusual duration (for such associations) of almost sixty years. It expired in 1774. It included among its original or early members, Principal Wishart, Bishop Horsley, Colin Maclaurin, John Stevenson, Professor of Logic, Lord Auchinleck, several of the ministers of Edinburgh and neighbouring gentry, and, finally, Sir John Pringle, afterwards President of the Royal Society of London. No publications are known to have proceeded from this Club.†

Contemporary, in part, with the Rankenian Club was a Society for the Improvement of Medical Knowledge, instituted in 1731. This Society, of which little perhaps is now remembered save its published Transactions, appears to have been conducted with an enlightened sense of the dignity and importance of associations for the promotion of science, which its founders justly considered to be more advanced by publishing able papers, than by making a parade

* [By Lord Woodhouselee] two vols. 4to. Edin. 1807, vol. i. p. 174, and list of members, Appendix p. 50.

† Since the reading of this address I have been indebted to Professor Fraser of the Edinburgh University for a reference to an interesting allusion to the "Rankenian Club," contained in Dugald Stewart's First Dissertation on the Progress of Metaphysical and Ethical Philosophy, part ii. sect. 4, where he speaks of Berkeley's celebrated system of Idealism having "attracted very powerfully the attention of a set of young men who were then prosecuting their studies at Edinburgh, and who formed themselves into a society for the express purpose of soliciting from the author an explanation of some parts of his theory which seemed to them obscurely or equivocally expressed. To this correspondence the amiable and excellent prelate appears to have given every encouragement; and I have been told," adds Mr Stewart, "by the best authority, that he was accustomed to say that his reasonings had been nowhere better understood than by this club of young Scotsmen." To which Mr Stewart adds this note: "The authority I here allude to is that of my old friend and preceptor, Dr John Stevenson, who was himself a member of the *Rankenian Club*." Mr Fraser justly remarks, that the dates tally well with this statement; Berkeley's "Dialogues" having been published in 1713, and the Rankenian Club having (as stated above) been founded in 1716.

of ceremonious meetings and printing lists of dignified office-bearers. With a reticence which we all must regret, the six volumes of *Medical Essays* give no clue to the constitution of the Society, the nature or frequency of its meetings, the names of the presidents, nor even of the diligent secretary by whom, no doubt, its Proceedings were edited.*

I think I am entitled to assume that the papers were fully equal in point of merit to those contributed on medical subjects to the Royal Society of London, or any similar institution. They went through more editions than one, were translated into foreign languages, and were highly commended by the celebrated Haller. It is reasonable to believe that the wide reputation of the Edinburgh Medical School dates from the publication of these important Essays.

In a paper on the Climate of Edinburgh, which I contributed a few years ago to the Royal Society's Transactions,† I have brought into view the early meteorological observations contained in the *Medical Essays*, though by whom they were made does not appear.

The six volumes of *Medical Essays* terminated in 1744. In 1737, at the suggestion of the celebrated Maclaurin, the objects of the Society had already been extended so as to include general science and literature.‡ It had not existed for many years in this form before political troubles antecedent to and during the insurrection of 1745-6 seriously impaired its usefulness, and probably prevented the separate publication of its Transactions, which was from the first contemplated.§ The death of Maclaurin, in June 1746, which

* An incidental notice, however, in the Introduction to the first volume of the Royal Society's Transactions, informs us that the secretary was the first Professor Monro, who was also a large contributor to the *Essays*.

† Vol. xxii. p. 327.

‡ The date usually assigned is 1739. But from two letters of Maclaurin printed in the "Scots' Magazine" for June 1804, the earlier date is certainly correct. Mr David Laing has shown me a pamphlet (of sixteen quarto pages) containing the Regulations of the Society and a List of Members. The List of Members is dated 1739; but at page 3, the first Thursday of December 1737 is fixed as the first day of meeting.

§ The papers read at the Society were in part printed in the later volumes of the *Medical Essays*, in the *Philosophical Transactions*, and in *Maclaurin's Fluxions*. It appears from a notice in Mr R. Chambers's *Domestic Annals* (vol.

was immediately traceable to his exertions on the side of the English in the melancholy struggles of the period, was a heavy blow to its usefulness, and a mass of papers connected with it were found to have been in his possession, which could be only partially recovered. Some of these were published in 1754, under the title of *Essays and Observations, Physical and Literary, read before a Society in Edinburgh*, and they were followed by two other volumes in 1756 and 1771. The first president of the Philosophical Society was the Earl of Morton (afterwards president of the Royal Society of London), Maclaurin and Dr Plummer (Professor of Chemistry) were secretaries. Afterwards Professor Monro (*Secundus*), and the celebrated David Hume, acted as secretaries. The Society then held its meetings in the Advocates' Library. Medical subjects still greatly predominated in the Transactions; but among the contributors appear the names of Maclaurin, Lord Kames,* John Stewart (Professor of Natural Philosophy), Matthew Stewart, Porterfield, Melvill, and Joseph Black.†

It is no small credit to this unpretending Society that it not only gave from its members two Presidents to the Royal Society of London, but reckoned amongst its contributors perhaps the two most eminent disciples of the Newtonian school which Britain produced in the whole of the eighteenth century,—namely, Colin Maclaurin and Matthew Stewart. The Philosophical Society of Edinburgh was the immediate parent of the Royal Society.‡

The Royal Society of Edinburgh took its rise in a meeting of the Professors of the University of Edinburgh, many of whom were also members of the Philosophical Society,§ on the proposition of Prin-

iii. p. 477), that, in 1743, the Society advertised for specimens of stones, ores, saline substances, bitumens, &c., to be sent to their secretary, Dr Plummer, and it is stated that "the Society undertake, by some of their number, to make the proper trials at their own charge for discovering the nature and uses of the minerals, and to return an answer to the person by whom they were sent, if they are judged to be of any use, or can be wrought to advantage." The quotation is from the *Edin. Evening Courant*, 22d Aug. 1743.

* Henry Home, Lord Kames, became president about 1769, and contributed greatly to the success of the Society.

† Dr Black's sole contribution was his celebrated "Experiments on *Magnesia Alba*," *Essays*, &c. vol. ii. p. 157.

‡ See *Life of Kames*, i. 184, and *Trans. Roy. Soc. Edin.*, i. p. 6.

§ The last survivors in our body of the Philosophical Society were, Profes-

cipal Robertson, towards the end of 1782. It is stated to have been founded "on the model of some Foreign Academies," and so far differed from the Royal Society of London, that literary objects were equally promoted with science, and the interests of literature represented by a Literary "Class" or subordinate Academy, having distinct meetings and office-bearers. It appears from a curious letter of Professor Dalzel, in Professor Innes's *Life of Dalzel*,* that the Royal Society was more particularly modelled on the Berlin Academy, and that its rise was partly due to a contest between Lord Buchan and the Society of Antiquaries on the one hand, and the University and Faculty of Advocates on the other. The result, however, of this party-war was in favour of the interests of science and literature; for the Society received a Royal Charter, and was formally constituted at a meeting held in the College Library on the 23d June 1783, under the presidency of Principal Robertson, at which were also present the Lord Provost, Lord Justice-Clerk Miller, Professors Cullen, Monro (*Secundus*), Hugh Blair, John Walker, Adam Ferguson, John Robison (who was then appointed secretary), the Solicitor-General Ilay Campbell, and several members of the Faculty of Advocates, the celebrated Adam Smith, and Mr Hunter Blair, M.P. for the city of Edinburgh.

The Society started at once into vigorous existence, and, looking especially to the reputation of the members of the Literary Class, few societies in any country have given a fairer prospect of a distinguished career. The members were either Resident, Non-Resident, or Honorary. The number of Original Residents was 102, and of Non-Residents, 71; and this before the Society had ever held a meeting. A short time later, the total number of members belonging to the Physical Class was 101, and to the Literary Class, 114. An excerpt from the MS. list of original members, in Professor Robison's handwriting (exclusive of those who have been named as founders of the Society), will give no mean idea of the eminent position of Edinburgh in the literary world of that day:—

sor James Russell and Sir William Miller, Lord Glenlee. The latter died so lately as 1846, in his ninety-first year. The Minute-Books of the Philosophical Society were expressly conveyed to the custody of the Royal Society (see Minute, R.S., of 4th August 1783); but they are, it may be feared, now irrecoverably lost.

* Page 89 (30th Nov. 1782).

The **PHYSICAL CLASS** included Joseph Black, Clerk of Eldin, Sir John Dalrymple (Lord Hailes), James Gregory, James Hutton, John Playfair, Dugald Stewart, Lords Bute and Dundonald, Sir James Hall, James Watt, Dr Small of Dundee, Patrick Wilson; and in the **LITERARY CLASS** we find the Lord President, Chief Baron, and Lord Advocate, John Home, David Hume, Henry Mackenzie, Alexander Tytler (Lord Woodhouselee), the Duke of Buccleuch, Archibald Alison, Dr Beattie, Edmund Burke, Lord Morton, Lord Hopetoun, John Hunter of St Andrews, Thomas Reid, Young of Glasgow, Dalzel, and Mr (afterwards Sir Robert) Liston. The earliest meetings of the Royal Society (as well as that of its incorporation) took place in the University Library. A large subscription towards the erection of the New College was made by the Society, on the understanding that the Society should be accommodated within its walls; and space was actually allotted on the north side of the building. How this was frustrated I do not know. The formal meetings continued to take place usually in the same place (the Library), at least until 1808, with an occasional substitution of the Physicians' Hall. In 1810, the Society purchased a house, No. 40 George Street, where they were accommodated until 1826; when they removed to the rooms which they still occupy, under a lease from Government, in the Royal Institution Building in Princes Street.

I proceed to trace rapidly the fortunes of the Society, which almost on the very day that I address you has completed the eightieth year of its existence.

The first President was the Duke of Buccleuch. He was succeeded in 1812 by Sir James Hall, who, resigning in 1820, was followed by Sir Walter Scott. On the death of the latter in 1832, Sir Thomas Makdougall Brisbane filled his place, to be succeeded at his decease in 1860 by the Duke of Argyll. Thus we have the remarkable and very unusual fact, that the first four presidencies endured over seventy-seven years. The chief secretaryship has in the same period been held by only five individuals, of whom but two were removed by death.

The earliest period of the Royal Society, and also the earliest volumes of its Transactions, were marked by the efficiency of the literary department. The first two volumes show a substantial if

not precise equality in the extent of the published contributions devoted to literature and to science. The balance will even preponderate on the literary side, if we include the elegant biographies of deceased Fellows drawn up by accomplished authors. About 1793—only ten years from the origin of the Society—the activity of the Literary Class had already become materially impaired. But indeed at no period could the literary papers bear comparison in point of merit, as a whole, with those on science. The great men of letters, who lent the weight of their names to the institution, hardly maintained its reputation by their pens. The Robertsons, the Reids, the David Humes, the Fergusons, and the Adam Smiths, hardly contributed to the pages of the Transactions.

It appears from the minutes of the Physical and Literary Classes which are now before me, that towards the end of last century the meetings of the Literary Class became rare—not averaging three in a year—in consequence of the deficiency of communications. In 1807, when, owing to the interest excited by the geological discussions of the period, in which Sir James Hall, Professor Playfair, Lord Webb Seymour, Professor Jameson, Dr Thomas Thomson, Mr Thomas Allan, and Mr Macknight took active parts, the business of the Physical Class literally overflowed into the Literary Class, the evenings appropriated to the latter, and not taken up by literary papers, being devoted to science. In the following year the minute-book of the Literary Class ceases altogether, and the separate meetings appear to have been discontinued from that date (1808). Afterwards a few literary papers were received at the ordinary meetings, without any attempt at separation. It was, however, only in 1827 that the distinction of the two classes was finally abandoned in the annual election of office-bearers, and *that*, not from any disinclination on the part of the Society to afford honourable room to literary papers, but simply from the cessation of such communications. It is perfectly understood that a renewal of these would be considered to be a credit to the Society, and I hope that our literary friends will be induced to give us the benefit of their support and their contributions.

With the exception of the Literary Class, the Proceedings of the Society were at no time marked by more energy and importance than during the first twelve or fifteen years of the present century,

when the geological discussions to which I have referred made Edinburgh the chief centre of information on such subjects. They gave rise to the masterly papers of Sir James Hall, with which at that time the Transactions were enriched.* These were followed or accompanied by the early communications of Sir David Brewster on Polarization and other parts of Optics, which added much to the scientific reputation of the Society.

The accession of Sir Walter Scott to the presidency in 1820 did not reanimate the Literary section of the Society. He contributed no paper, although he at one time very regularly presided at the ordinary meetings. From 1832, when the printing of the "Proceedings" at every meeting commenced, to the present time, nothing in the history of the Society calls for special remark. During that period, as at former ones, there have been fluctuations in the prosperity of the Society, both as regards the number and value of the communications received, and the interest taken in the meetings by the Fellows at large and by the general public. That such must occur the founders of the Royal Society were sufficiently aware. At the very opening of our Transactions we find it observed, that "Institutions of this kind have their intervals of languor as well as their periods of brilliancy and activity. Every associated body must receive its vigour from a few zealous and spirited individuals who find a pleasure in that species of business, which, were it left to the care of the members in general, would be often reluctantly submitted to, and always negligently executed. The temporary avocations, and still more the deaths of such men, have the most sensible effects on the societies to which they belonged. The principle of activity which animated them, if not utterly extinguished, remains long dormant, and a kindred genius is required to call it into life."† The truth of these remarks must be apparent to all who have had experience in such matters. They ought to encourage us to keep alive the interest of our meetings, and to maintain the character of our Society at times when

* The last meeting at which Sir James Hall appears to have presided, was that of the 5th June 1820. He resigned the presidency in November following. His last paper printed in the Transactions, "On the Consolidation of the Strata of the Earth," was read in March 1825.

† Trans. R. Soc. Edin., vol. i. p. 6.

either may appear to be in danger of flagging, resting well assured that the development of knowledge, and the intellectual resources of new generations, will ever from time to time give lustre and importance to associations destined not to meet the caprices or fashions of a time, but to promote the great cause of scientific and literary progress.

III.—I now proceed to consider *what changes the progress of science or of society renders necessary or desirable in the working of associations such as the Royal Society, and how far such changes are safe and prudent?*

The most casual reader of history, or observer of men, knows that the inevitable progress of change—material, intellectual, and social—deprives of the character of permanence all human institutions. Those Institutions are most likely to be perpetuated, in which a wise forecast of progressive change adapts their parts to the wants and circumstances of the age. If this be true of political Constitutions, of Churches, of Universities, of Charities, nay even of public Amusements, it is no less true of learned Societies. Considering that the Royal Society of London and the French Academy of Sciences are each two centuries old, we rather must wonder—taking into view the astonishing progress, or indeed reconstruction, of the sciences during that time—that so much of their original constitution still remains, than that changes have been needed, or are still required, to meet the wants of successive generations.

I shall consider some of the most obvious changes of condition under which learned associations pursue their vocation now and formerly. In doing so, I shall speak principally of their relations to the natural and experimental sciences.

The Florentine Academy was an excellent *type* of what a physical association of the seventeenth century was and ought to have been. The members collected apparatus, they had a laboratory, they furnished funds for these; and the associated philosophers (who were select in number) met to witness the experiments, and to argue upon the conclusions to be drawn from them. The Royal Society of London, as well as the lesser societies from which it sprung, took a precisely similar course: they had a paid Operator and Editor of their Transactions; and they remitted to individual mem-

bers or small committees to try experiments, and to report the results to a succeeding meeting.

This seems to be the most perfect constitution of a society for investigating nature which we can well imagine. It bears a close analogy to the *Philosophical College* of Bacon,—the *Solomon's House* in the allegory of the New Atlantis,—which is generally believed to have been really an antecedent (in the way of suggestion) to the formation of the Royal Society of London. But it is now less practicable than formerly, for many reasons, of which I will enumerate a few. For example, these Societies include in our time so many members that they can no longer consult as a committee, but must rather listen as an audience. Again, the minute subdivisions into which the sciences are now split, render a perfect comprehension of one science alone almost the occupation of a single life. Hence, unless such a society were to consist all of chemists, all of astronomers, all of comparative anatomists, and so forth, the proceedings, and even the experiments, which in a former age interested nearly all well-informed men alike, are now interesting or intelligible to only a small section. In like manner, an experimental investigation is no longer the simple and absolute thing which it was. A member of the Royal Society is no longer instructed, as in former times, to try, for instance, whether spirit of wine burns or not in an exhausted receiver; whether salt is separated from water in freezing; to dissect an oyster; to measure whether pebbles and other minerals grow or not; whether eggs frozen continue fecund; to repeat the Magdeburg and Torricellian experiments; to determine the relative weight of lead and water; and to report the result of any such experiment at next week's meeting.* But the investigations are now-a-days complicated, the experimental means alone furnish matter for long and anxious preliminary consideration; the precision needed, and the calculations on which it depends, are matters consuming time, and often can be better attained by the patient efforts of an individual, than through any amount of co-operation; nay, the very results, unless involving a capital discovery (which is a rare and fortunate accident), cannot be stated without an amount of detail often wearisome to those who are not especially interested.

* These instances are all taken from the early Journals of the Royal Society of London.

These, among others, are causes why men cannot now do the hard work of science in their collective capacity as associations. How rarely do we even see two philosophers (at least in this country) engaged in a common investigation !

One result of what has been stated is the breaking down of scientific communities into special aggregations or societies for the promotion, say, of astronomy, or geology, or chemistry, or even minuter subjects, such as microscopic anatomy, numismatics, or entomology. Such associations bear testimony to the difficulty, which increases year by year, of rendering the sciences intelligible and interesting, in respect of new discoveries, to the mass of even well-educated men. They are so far a protest against the utility of associations at all, since they tend to reduce the prosecution of science more and more to an individual affair.

In communities less numerous and comprehensive than those of London or Paris, the difficulty is not less felt, though the means of meeting it (at least temporarily) are not so attainable. The largest provincial town or district cannot possibly maintain the group of associations which, even in London, may be said to enjoy a precarious intellectual subsistence. I do not mean to say, that more subordinate special associations are unadvisable, even in the provinces ; on the contrary, I believe that they may do much good. But one may fairly deprecate the encouragement of a spirit of rivalry towards the larger and more national and permanent institutions which already exist, such as the Royal Society may fairly claim to be. To maintain the character, for energy and stability, of one central Society, is in reality the common interest of all of that not very numerous body of persons who cultivate science for its own sake. Delightful and instructive meetings may advantageously be held by a local body of geologists or chemists, or naturalists ; but such associations require immense vitality to be permanent. Practically, they fall into abeyance, in perhaps twenty or thirty years, or even less ; and if they have attempted to record their labours by publication, these publications having never attained more than a very limited circulation, become inaccessible and forgotten. The matured written results of those labours which properly form a subject of almost private discussion in minor societies, are best consigned for final preservation to the

publications of a central and enduring association. A good example of what I here intend to indicate, may be found in a private Parisian Society, founded early in this century, called *La Société d'Arceuil*, from the name of the country-house of its president, Count Berthollet, where it met. It consisted of the *élite* of the French Academy of Sciences, including Laplace, Humboldt, Gay Lussac, Biot, Arago, Decandolle, &c. But the Memoirs (in three volumes) published by this most distinguished and delightful club, including such papers of capital importance as Malus's original one on the Polarization of Light, Humboldt's on the Isothermal Lines, Thenard on Ethers, and Arago on the Colours of Thin Plates, must be considered as in fact withheld from the Proceedings of the national Academy, and they must now be sought for consultation in a small printed collection in the hands comparatively of few. It is needless to add, that the Society lasted for but a few years.

I may also include among the causes which have of late years affected the prosperity of our own and similar societies, that tendency to *centralization* which, during the last half century, has affected so many interests, political, social, commercial, and also scientific and literary. The facility of communication with London has facilitated that tendency to southward emigration, so long, and not unjustly, attributed to Scotchmen. But far from aiding their return, the facility seems to be all in one direction. The larger arena for practical talent to be found in the metropolis attracts even our writers of literary essays, and our labourers in the cause of physical science. It is a fact which admits of no doubt, that the Scottish Geological School, which once made Edinburgh famous, especially when the Vulcanist and Neptunian War raged simultaneously in the hall of this Society and in the class-rooms of the University, may almost be said to have been transported bodily to Burlington House. Roderick Murchison, Charles Lyell, Leonard Horner, are Scottish names, and the bearers of them are Scottish in everything save residence. Even the field of their labours is in no small measure Scottish; and the Silurian standard is waved over half the length and breadth of our "primitive" Highlands. Our younger men are drafted off as soon as their acquirements become known. Professor Ramsay was early called from his voluntary labours in

Arran to English soil; and we only retain the services which our townsman Mr Geikie volunteers for our instruction, so long as the central forces of Jermyn Street suffer him to linger within the Scottish border. Others, who still reside in Scotland, not unnaturally seek a larger audience, and a more rapid publicity for their memoirs, by transmitting them to London. This is reasonable and inevitable. Yet a certain feeling of patriotism might still retain a portion of their labours for the Transactions of our Scottish Royal Society. Indeed, it is remarkable that the centralization of which I have spoken seems to reside in London chiefly; for we do not find much tendency in Scottish towns or universities (with a few honourable exceptions) to contribute to the literary and scientific wealth of our national metropolis. I believe that the original list of the Royal Society of 1783 includes more provincial members, at all events from the Universities, than we can reckon in 1862. Of all the changes which have befallen Scottish science during the last half century, that which I most deeply deplore, and at the same time wonder at, is the progressive decay of our once illustrious Geological School. Centralization may account for it in part, but not entirely.

But I have allowed myself to be partly withdrawn from the enumeration of the causes of change which have affected the business and functions of societies for the promotion of science and literature. Another of these is the alteration of domestic habits in some important particulars. Most of the older societies commenced in *Clubs*, which met at taverns, in conformity with the all but universal usage of the period. The "Philosophical Club," which foreshadowed the Royal Society of London, met in 1649 at the Bull's Head in Cheapside; and the germ of the Royal Society of Edinburgh was a club meeting at Ranken's Tavern. All this is past and gone. The Drydens, the Addisons, and the Johnsons of our day, hold forth no longer at "Will's" or "The Mitre." If a more domestic, we are certainly a less "clubable" generation.* The effect tells even upon our literary and scientific undertakings. The clubs of modern London are rather institutions for the luxurious accommodation of individuals than for social intercourse; and the attempt of Sir H. Davy and others to combine them systematically with literary conversation, in the case of the "Athe-

* "Boswell is a very *clubable* man." Johnson, in *Boswell's Life*.

næum," proved a failure. An analogous influence is found in the vast expansion of intellectual intercourse through the means of the press, and in the filtering of knowledge of all kinds—of scientific knowledge, perhaps, especially—through the widely extended system of popular lectures. In these two features of the age, we find sufficient reasons alone to account for much of the social change to which I have referred. Newspapers, magazines, and ephemeral literature of every kind, supplant the oral intercommunication characteristic of the days of clubs. A man takes home with him to his fireside the gossip, the jokes, the discoveries, the discussions, grave or gay, of the day. And in matters of science it is somewhat the same. Much he finds of all that is most occupying the thoughts of able men pursuing natural knowledge set down in the pages of the "*Athenæum*," or "*Macmillan*," or "*Good Words*," perhaps by the very persons who really are most able to speak of such things. Nothing of importance can be communicated to a society which does not soon become matter of public notoriety through such channels.

But still wider is the influence of those popular discourses or lectures which now practically supply to many persons of general information, but not professed students, the intellectual interest formerly sought in the meetings of our learned Societies, and I believe I might add, in the case of Edinburgh, in some measure from our University courses also. The Royal Institution of London commenced this system with splendid advantages, and its popularity (which could scarcely increase) has been maintained with little if any diminution for sixty years. But in fulfilling its own task of instructing intelligent persons in the latest results of scientific discovery, often from the very mouths of the discoverers themselves, it has deprived of one great attraction the meetings of the Royal Society, the great fountain and source whence such knowledge ought naturally to flow. Similar influences have prevailed in Edinburgh, to the diminution of the attendance in this place. Those who can look back to the audiences assembled in this room when ordinary scientific papers were read, from twenty-five to thirty years ago, will corroborate my testimony as to the change which less than even one generation has brought about. The social spirit of coming together for common objects, self-im-

provement in the first place, and the charm of a periodical, a fortnightly meeting with like-minded persons (seldom perhaps met with in the interval), counteracted the tendency to criticise, and the intolerance of hearing something read not immediately or directly interesting to the hearer.

Were I to enumerate the names of that large band of our fellow-citizens, our professors, our distinguished lawyers, our country gentlemen and mere amateurs, who, meeting after meeting, used to occupy almost the same individual places on these benches, so that their loss or absence could in a moment have been noticed—I should recall to many, even now present, the different phase, in this respect, which the society of Edinburgh presented then from now. Let me first name, almost at hazard, a few of those whose images live in my memory as I now address you, as among those who as a rule attended, and as a rare exception were absent: There was the ever animated, zealous, and punctual president, Sir Thomas Brisbane; the polite and decorous Dr Hope; the indefatigable, unassuming Lord Greenock; the sagacious Dr Abercrombie; the lively, unresting Sir George Mackenzie; the hospitable Professor Russell (whose academic suppers are not even now forgotten); the beneficent, large-minded Dr Alison; the kindly, genial Professor Wallace, close to whom usually sat Mr James Jardine, with his finely chiselled features and intellectual forehead, the accurate Mr Adie, and the conscientious, modest astronomer, Mr Henderson: there was also the ingenious Sir John Robison, fertile in expedients; the frank and manly Dr Graham; the quietly humorous and ornithological Mr James Wilson; the encyclopædic Dr Traill; and the shrewd and well read, but reserved Mr W. A. Cadell. Besides, there were many others who, if they rarely took an active part in the business of the Society, were not the less persevering in their attendance,—thus giving evidence of an interest in its welfare and permanence, which any exigency, or even opportunity, would have called in action: there were Sir Henry Jardine and Lord Meadowbank; Dr Brunton and Dr Neill, occupying probably the same bench with Mr R. Stevenson and Mr Bald; Mr John Craig, Sir William Newbigging, Professor J. S. More, Mr William Wood, Archdeacon Williams, Mr George Swinton, Sir Joseph Straton, Dr Borthwick, and Mr Stark. I could far

more than double the list by including those who, though not absolutely regularly, attended so frequently that their faces were familiar in this room, and their presence missed in the social gathering round the tea-table later in the evening.

I fear, gentlemen, that we now-a-days allow ourselves to become too mechanically intellectual, and also too intellectually fastidious. If the recent movement which has been set on foot for deepening and enlarging the interest felt by the members in our meetings is to take any root and produce any results, I am persuaded that it must be, though not solely, yet mainly by our Fellows recollecting that though the meetings of the Royal Society are intended for the communication of knowledge by the reading of papers, they always were, and still are, intended quite as much to promote a cordial feeling amongst those (at best but a small number in the midst of a teeming and busy population) who profess an interest in the progress of literature and science, and whose presence and conversation may contribute to this end, as well as the more formal contributions of others. I ask the more numerous portion of our Associates, if they are not disposed to contribute papers to our meetings, at least to make a contribution of *themselves*—their personal attendance, their approving interest, their mite of influence towards our commonwealth of letters. We have seen how much popular lectures have done elsewhere towards individual improvement, and the increase of a certain kind of knowledge amongst various classes; we have attributed a still wider and more beneficial influence to the periodical literature of the day; but neither of these is a *social* form of scientific and literary effort. It is *that* which we claim as one of the two remaining (perhaps only permanent) functions of our great Societies planted in different times from the present: the *one* is to afford to authors, especially to the authors of learned dissertations on science, the means (otherwise wholly unattainable) of bringing their labours in a printed form before the scientific public; the *other* function is to encourage, by an expression of personal sympathy and interest, the labours of those who devote themselves to the too often ungrateful toil of original investigation.* To the utility of the first, our Transactions bear, I

* To the two permanent functions of scientific associations mentioned in the text—namely, the printing and circulation of memoirs, and the promo-

will take it upon me to say, satisfactory testimony. Of these Scotland has just cause to be proud. Nor, on the whole, have we to complain of any deterioration in the memoirs by which this Society becomes known to the learned world. The second fulfilment of our objects of incorporation seems in some danger of being forgotten. While the older members of the Society must feel a pleasure in meeting, fortnight by fortnight, those with whom they worked in earlier days, or with whom they perhaps strove in generous rivalry, thus keeping alive those embers of mutual interest which the changing gales of life are too ready to disperse and extinguish, they may also lend their countenance to the efforts of younger men who are treading in their steps, and who may soon, if they have not already done so, occupy their own seats of influence or of honour. They may thus aid in giving coherence to the chain which binds generation to generation in the pursuit of truth, and in establishing a *personal* relation between the intellect of each, the impressive influence of which we are too apt to forget. I say, gentlemen, that this is a personal affair, which no abstract ideas can supersede,—I say that no popular lecture, listened to by hundreds of persons immediately to be dispersed into their specific individuality, no perusal of scientific digests in the study or at the fire-

tion of personal intercourse amongst literary men—we may add a *third*, that of rewarding meritorious papers or discoveries by medals and other more or less honorary distinctions. Such have existed both in British and Foreign Societies from an early period until the present. They are of two classes: rewards offered by anticipation for researches on definite subjects proposed (this obtains mostly abroad); and premiums awarded to the best paper or most considerable discovery, either in science generally, or in some specified branch of it. This last form is more usual in this country; and such premiums are our Keith, Brisbane, and Neill medals. I think we must conclude that the foreign system has worked best. Many considerable memoirs of the last century on physical astronomy and similar subjects were offered in competition for such prizes. The stimulus is one which addresses itself variously to different minds, and on the whole seems to be less effective in these later times. One disadvantage of the award of medals for researches not previously defined, is the greater difficulty of awarding them without partiality or bias. A *fourth* kind of encouragement to science which our societies sometimes exert is the bestowal of funds for the prosecution of experimental investigations. This is frequently a stimulus of no small value. It was first systematically applied in this country by the British Association; and the Government of the country have wisely committed an annual fund for such purposes to be dispensed by the Royal Society of London.

side, can replace such influences. I could speak from personal experience, if necessary, of the influence of meetings like ours, dull and commonplace though they may appear to some, upon the mind of the young student; of the zest with which he feels himself, perhaps for the first time, made the recipient of knowledge in its actual dynamic progress, not through its past hoarded acquisitions merely; the enthusiasm with which he sees (perhaps also for the first time) men of whom he has read in books, and on whom he looks with possibly excessive, yet still elevating and generous respect; how, meeting after meeting, he approaches somewhat nearer to those thus distantly regarded, and finally addresses them, though with something of reverence, as friends having a common interest in common and noble pursuits. If such alone were a result of our periodical meetings, such would alone be an adequate object for us to aim at. It is only by a certain measure of self-denial, a certain throwing off of passive or indolent habits, that we can hope to render our meetings attractive to ourselves and to one another. If all come, all will be interested; let each man, instead of pleading his inability to contribute his share to the literary and scientific proceedings, contribute at least his countenance. There is something magnetic in the concourse of intelligent persons. Not only does each element attracted increase the aggregate by its adhesion, but the aggregate so increased draws new molecules with greater force within its sphere, till the whole gathers in an increasing progression, and (as physical philosophers tell us) evolves by the mere act of aggregation that heat and light which maintain energy and vitality even to the bounds of the universe.

We all know the history of the British Association for the Advancement of Science; some here remember its origin; few have not been present at some of its meetings. Let me remind you how small a fraction of that animated whole is composed of direct contributors to the advancement of those sciences which the Society was formed to promote. Let me ask you, what would be the result if every member were requested to withdraw, who had not some paper to communicate or some remark to offer. You may imagine the dire scramble which would ensue, the clearing of benches, the faces of dismay. The dismay would not be all on the side of the retreating listeners. The small knot of studious philosophers left behind

would feel discouraged by the removal of that sympathising auditory. Have we not all heard with patience, sometimes almost with interest and admiration, papers read, from which we must afterwards have confessed to ourselves if not to others that we were able to carry little or nothing away? Yet that intelligent concourse of partially instructed persons gives life to the meeting, sanction and encouragement to the really knowing, a taste for knowledge, respect for its professors, and some portions at least of positive acquirements to those who are not so. I believe that we ignore too much this element as inherent in the constitution of our learned societies. If we continue to do so, we shall degenerate (I venture to call it a degeneracy) into mere publishing clubs, whose Transactions are read by a select few, but which exist and shine by a mere "*lumen siccum*,"—disembodied existences claiming no sympathies, calling forth no regard, combining no diversities of interest.*

* I may perhaps be allowed to call attention to a striking change (on the whole) in the character of the publications of learned societies; I mean the great detail into which the papers generally run, especially in those on experimental Physics, mixed Mathematics, and Natural History. The bulk of these communications is, it may be feared, too often out of proportion to the intrinsic value of the matter which they contain. It is by no means without example to see the pages of Transactions (as well Foreign as British) occupied by a description of experiments of which the results were merely negative, and by mathematical investigations with no less indefinite conclusions. Such papers are rarely read by any one. They increase the bulk and expense of Transactions, and bewilder the unaided student. Even in cases less extreme they are encumbrances to scientific literature. An author, who has before him no fear of a printer's bill, or the remonstrances of an impatient publisher, is but too apt to please himself by expanding a small amount of matter over a goodly number of those handsome quarto pages, in which his lucubrations appear so advantageously to the eye. Even where numerical precision in the results is of primary consequence, excessive elaboration in printing the steps of calculation and instrumental corrections is often unnecessary, as well as extreme minuteness in describing forms of apparatus, and results of chemical reactions, especially where such details are not remote from common apprehension. A stricter editorial censorship than the Councils of societies usually venture to exert (similar in *kind*, though not in *degree*, to that which the editors of our leading periodicals exercise over contributors not less eminent in their departments), seems to be called for, by the expanding bulk of the volumes published by learned Bodies.

An evil nearly allied to this, is the fragmentary manner in which authors are apt to contribute the results of their inquiries. This is a consequence of

IV.—On the Changes in the Society during the last Twelve Months.

The past year has produced more than the usual number of casualties both on the home and foreign lists of the Society. During its course the Society has had to deplore, in common with the whole British Empire, the premature decease of H.R.H. the Prince-Consort. It would be out of place here to offer a detailed eulogy on one whose connection with our body was comparatively slight and indirect, but whose loss has been profoundly felt in nearly every home in these islands. An enlightened patronage of Science and the Arts was one of the especial characteristics of his patriotic, unselfish, and too short life.

Amongst Foreign and Honorary Fellows we miss three, all of whom were on the verge of, or had exceeded, fourscore years. These would by themselves afford topics for an address. I must allude to them very briefly.

The venerable JEAN-BAPTISTE BIOT was born 21st April 1774. He has been an Honorary Member of this Society for the uncommon period of forty-seven years, having been elected in January 1815.* He had become a member of the French Academy of Sciences in 1803, his jubilee having been celebrated nearly ten years ago. But it is also a singular and probably unprecedented fact, that at the time of his death he was a member of three out of four of the Academies composing the Institute of France; that is, of the *Académie Française*, and that of Inscriptions and *Belles Lettres*,

the struggle for priority in even second and third rate results of scientific investigation, though these are often no more than corollaries to propositions well established, or assumed to be so. Such *caveats* are better adapted for the weekly or monthly journals, where they properly and reasonably find a place. It seems to be the business of societies to consult more than they usually do, the instruction and convenience of readers, and less exclusively the sometimes inconsiderate demands on the part of authors. There is, perhaps, no society to which these remarks do not more or less apply; but the case of the *Comptes Rendus* of the French Academy of Sciences supplies an example of excessive publication so generally admitted to be an embarrassing evil that it may be referred to as a warning.

* I find by the old minute-books of this Society, that a paper by Biot on the Polarization of Light by Crystals, was read by Sir David (then Dr) Brewster at the ordinary meeting of the 15th January 1815.

as well as of the Academy of Sciences. His diversified abilities as an author are well exemplified in the miscellaneous writings collected by him before his death under the title of *Mélanges Scientifiques et Littéraires*.*

His fame, however, chiefly rests on his scientific productions, especially in connection with the polarization of light. His writings on astronomy, though voluminous, are not original, except, perhaps, in their historical and antiquarian aspect. Even in his own subject, that of optics, there did not fall to his share so many capital discoveries as from his opportunities, zeal, and unbounded perseverance, might perhaps have been expected. His discovery (independently of Seebeck) of the rotation of the plane of polarization caused by liquids, is the chief of these, and he pursued it with unflagging energy into its numerous consequences during at least forty years. Biot was an instance of all that mere talent and perseverance, unsustained by great genius, can attain. His long life was one scene of intellectual labour from first to last. Brought up at the feet of the great Laplace, he was perfectly conversant with his writings, and with all that belonged to the most advanced state of mathematics of the time. His optical researches were pursued according to the traditions of the same school, as contained in the Emission- or Corpuscular-Theory. First in his latest years did he begin to betray a consciousness that Young, Fresnel, and Arago might be right, and that light is an undulation after all. But the imperfect concession had then lost all grace. His theory of Moveable Polarization, and generally his modes of conceiving complex physical phenomena, were more elaborate than satisfactory.

One of Biot's most considerable contributions to science was his determination of the length of the seconds-pendulum in different latitudes. It was the occasion of (I believe) his only visit to Scotland, which took place in the summer of 1817, when he made numerous observations at Leith Fort, and then undertook his memorable journey to the Isle of Unst, the northmost of the Shetlands, of which he has left an interesting memorial in the first volume of his published Essays.† Thus he had the no small distinction

* 3 vols. 8vo. Paris, 1858.

† Taken from the Memoirs of the Academy of Sciences.

of having carried on these important labours, under very great difficulties, over a terrestrial arc of 22° of latitude, extending from the Isle of Ivica in the Mediterranean, to that of Unst, not very far from the Arctic Circle. Of his true devotion to the scientific career which he had proposed to himself, it is impossible to speak too strongly. No distinctions except literary ones had any attraction for him. He carefully eschewed those political promotions coveted by too many of his academic compeers. His views on politics, though definitely monarchical, were never obtruded. The isolation induced by his habits of unremitting study fostered a coldness of disposition often manifested by him towards other scientific men. He had few intimate friends out of his family circle, and his encouragement towards young aspirants was cautious and intermitting. It is worthy of being added in his favour, that during the last thirty years of his life he recognised, in a marked manner, the obligations of his religious creed. Notwithstanding his very advanced age, he continued his studies on Indian astronomy to within a very short time of his death, which he met with Christian composure, on the 3d February 1862, when he had nearly completed his eighty-eighth year.

FRIEDRICH TIEDEMANN, the eminent anatomist and physiologist, was born at Cassel in 1781, and died on the 22d January 1861, in the eightieth year of his age. His death was inadvertently not noticed at our last anniversary. Tiedemann was one of the most eminent comparative anatomists and physiologists of Europe. His earliest paper of note, that on the Circulation of the Echinodermata, obtained a prize offered by the French Academy of Sciences. He became Professor of Anatomy at Heidelberg in 1816, and continued so until 1848. During this period he published a celebrated work on the Human Brain, and another on that of the Monkey, as well as several works in conjunction with Oppel and Treviranus. He was blind during some of the later years of his life, but recovered his sight through an operation for cataract. Subsequent to his leaving Heidelberg, he lived in great retirement at Bremen and Frankfort.

LOUIS ALBERT NECKER, honorary Professor of Mineralogy and Geo-

logy at Geneva, was born there in 1786, and died at Portree, in the Isle of Skye, on the 20th November 1862, in his seventy-sixth year. Mr Necker was far more intimately connected with this country and with this Society than our foreign members usually are; indeed he might be called a naturalised Scotchman, and he contributed papers to our Transactions. It was my intention to have entered on his biography here at some length. But I think it will be best to bring before the Society in a separate form the facts and reminiscences which I have to offer.

On our home list, we have to lament the loss of 12 of our Ordinary Fellows; a considerable number of whom had, however, also attained the full term of human life. Their names are,—Robert Bald, John Cockburn, Norwich Duff, James Forsyth, James P. Fraser, John Fyfe, J. Burn Murdoch, James Russell,* John Russell, Thomas Stewart Traill, James Walker, and Alex. Maconochie Welwood.

To replace these we reckon also 12 new Fellows,—namely, Professor Archer, Rev. W. G. Blaikie, Mr Henry Cheyne, Mr Nicholas A. Dalzell, Mr A. M. Edwards, Rev. V. G. Faithful, Dr James Hector, Dr J. P. Macartney, Dr W. B. Mackinlay, Mr Edward F. Maitland (now Lord Barcaple), Dr E. Ronalds, and Rev. Robert B. Watson.

Our numbers, therefore, remain the same as last year.

I must confine myself to a very short obituary notice of a few of our deceased Fellows who showed most interest in the proceedings of the Society.

The senior in standing as a Fellow was Mr ALEXANDER MACONOCHIE WELWOOD, better known during his active life here as Lord Meadowbank. His father also bore the same title; and was a man of much acuteness, and an original Fellow of this Society. The late Mr Maconochie Welwood was born in March 1777, he joined the Faculty of Advocates in 1799, was made Lord Advocate in 1816, and a Judge in 1819. He retired from the Bench in 1843. He joined this Society in 1817, but was not, so far as I know, a contributor to our Proceedings. He, however, took an interest in them, and for many years attended the meetings regularly. He had a large circle of acquaintances in and out of the Society; and

* Who died since the Annual Lists were made up.

though in public matters his manner was occasionally dogmatic, he was of a kind and hospitable nature, and was much regarded by a large circle of personal friends. The frequency of his attendance here contributed to excite a spirit of interest in the meetings. For about twenty years past he had lived in calm retirement in the midst of his family, and on the property which he had an hereditary pride in cultivating and adorning. He died at Meadowbank on the 30th November 1861, in the eighty-fifth year of his age.

Elected in the same year with Mr M. Welwood, but his senior by one year, was Mr ROBERT BALD, who for many years occupied a very high position as a mining engineer. He was born at Culross, in Perthshire, in 1776, and soon after removed to Alloa, where he early gave his attention to mining, and attracted the notice of the Earl of Marr. He was ultimately engaged in the extensive Marr Collieries,—a connection which he held for a very long period. He commenced general practice as a mining engineer in Edinburgh about the year 1820, and was very extensively employed in Scotland, England, and Wales. He was requested by the Swedish Government to report on the coalfields of that kingdom, and received from the King of Sweden marked acknowledgments of the value attached to his report by the Government of that country. Mr Bald was elected a member of the Royal Society of Edinburgh in 1817, and was a contributor to its Proceedings. He was author of a "View of the Coal Trade,"* of the article "Mine" in the Edinburgh Encyclopædia, and of numerous other papers bearing on his profession. Mr Bald was universally esteemed; and during his long stay in Edinburgh he formed many lasting friendships, which death alone terminated. He was for long in ill health, and bore his protracted and severe illness with truly Christian resignation. The latter years of his once active life were spent in retirement at Alloa, where he died in December 1861, in his eighty-sixth year.

As connected by the nature of his occupations with Mr Bald, I next notice a third octogenarian among our Fellows, Mr JAMES

* In this work he made a benevolent and much required appeal on behalf of the miserable lot of women then employed in coal mines, under the name of "Bearers."

WALKER, the eminent civil engineer, who was born at Falkirk on the 14th of September 1781. He was educated at the parish school of Falkirk, and thereafter removed to Glasgow, where he studied at the University. He went to London in the year 1800, and commenced the study of engineering under his uncle the late Ralph Walker, who was then engaged in constructing the West India Docks. Mr Walker devoted himself almost exclusively to marine engineering, in which important branch of the profession, though his rise was gradual, he ultimately attained the position of the first authority of his day. He had not a very inventive cast of mind, but he had great caution and sound judgment, and above all the faculty of profit by his large and varied experience. His works were, in consequence, eminently successful. It would be out of place in this brief notice to attempt even an outline of his works, so varied were they in character, and so many in number. It may be sufficient to say that at the time of his death he was conducting, as Government engineer, the national harbours of refuge at Dover, Alderney, and Jersey, and the refuge harbour at the mouth of the Tyne. As engineer to the Trinity House of London, he constructed various lighthouses, including that on the Bishop's Rock, a very exposed situation. He was largely consulted in navigation and canal works; and the Stockwell Street Bridge at Glasgow may be adduced as a favourable specimen of his bridge architecture.

Mr Walker received the degree of Doctor of Laws from the University of Glasgow. He was appointed president of the Institution of Civil Engineers on the death of Mr Telford in 1834. He was a fellow of the Royal Society of London; and in 1824 he was elected into the Royal Society of Edinburgh. He had been for some time before his death in declining health, but to a robust constitution he added an abundant flow of cheerfulness and spirit; and even on the day before he died he was writing a report to the Admiralty on the subject of Alderney Harbour of Refuge. He was suddenly seized with a stroke of apoplexy, and expired on the 8th October 1862, in his eighty-first year. At his own request, his remains were interred in his family burial-place, at St John's Chapel, Edinburgh.

Dr THOMAS STEWART TRAILL was born on the 29th October 1781,

at Kirkwall, in Orkney, of which place his father was minister. Throughout his life he retained a most affectionate interest in his native islands. "He was," as we read in a contemporary notice, "*Orcadiensibus orcadensior*, and his face lighted up, and his hand gave an extra grip, when he met with a man whose young eyes had seen the Old Man of Hoy, and who had heard the roar of the Pentland Firth from the south."

He graduated in medicine in the University of Edinburgh in 1802, where he had been the fellow-student of Lord Brougham, Sir David Brewster, Principal Lee, and other eminent persons. He is believed to have settled in Liverpool in 1804, where he constantly resided as a physician in good practice until 1832. He was highly esteemed, professionally and personally, in that great mercantile city, and formed intimate friendships with its leading men. He promoted warmly the societies founded there for the diffusion of literature and science, especially the Royal Institution of Liverpool, of which he was one of the founders and the first secretary. He maintained throughout life an intimacy with Lord Brougham, having a common interest with him in many philanthropic objects. In 1832, he was appointed to the Chair of Medical Jurisprudence in this University, which he filled until his death thirty years later. He took great pleasure in lecturing. Chemistry, mineralogy, and meteorology, were his favourite sciences. In 1804, he delivered a popular course on chemistry for a benevolent object in Kirkwall. This is said to have been the first course of the kind given in Scotland. He lectured frequently in Liverpool; and after he became a professor in Edinburgh, he not only delivered his own course of lectures, but also repeatedly that of Professor Jameson on natural history; and once at least he lectured for a session in the chemical class, during Dr Hope's decline.

He was a diligent attender on this Society, and for many years curator of the library, with a seat in the Council. He contributed a great many papers to our Proceedings, and some are printed in the Transactions.* They are not always of an important class, but are of a kind very serviceable in promoting the interest of

* In volume ix., "Account of a Mineral from Orkney," and "Electromagnetic Observations and Experiments." Vol. xiv., "On a New Writing Ink." Vol. xv., "On Fossil Fishes found in the New Red Sandstone of

meetings such as ours, and a taste for science generally. This, indeed, was Dr Traill's *forte*. His tenacious memory storing up the results of considerable reading and extensive conversational intercourse, supplied him with ready materials for illustrating any topic brought under his notice. It is not surprising that, trusting largely to memory, his accuracy is not in all cases perfectly to be relied on. He was nominally editor of the eighth edition of the *Encyclopædia Britannica*, and he certainly contributed to it some forty articles; but his responsibility was, I believe, chiefly confined to the earliest volumes, the greater part having been practically edited by the able publisher, Mr Adam Black.

Latterly, owing to infirmity, Dr Traill ceased to attend the meetings of this Society, where he had, for a quarter of a century, occupied a familiar place. But his lectures he never discontinued, and persevered with them until within twelve days of his death. It was well known to his colleagues, that had he lived to complete that course, which was his thirtieth, he would then have resigned his chair. He died at Edinburgh, on the 30th July last, in his eighty-first year, being the *fourth* octogenarian on our list.

Yet one more venerable colleague and useful member remains to be noticed.

Mr JOHN RUSSELL, writer to the Signet, and for eighteen years treasurer of the Society, was born 22d February 1780. He was descended from three generations of men who had exercised in Edinburgh the same respectable calling. By his mother's side, however, he inherited of right a taste for literature; for she was daughter of Principal Robertson, an honourable connection, which Mr Russell always loved to recall. In point of fact, Mr Russell retained throughout an active professional career both the tastes and acquirements of a well-educated man and a scholar. He was intimate with many of

Orkney," and on "*Berg-meal*, or Mineral Flour of Degersfors, in Swedish Lapland." In vol. xvi., "Memoir of Dr T. C. Hope." In vol. xx., "On a Peruvian Musical Instrument." In vol. xxi., "On the Terbanehill Mineral." These titles give a good general idea of the varied subjects of Dr Traill's communications. His last contribution to the Society seems to have been that made on 15th February 1858, "Description of the Sulphur Mine of Conil [in Spain], preceded by a Notice of the Geological Features of the Southern portion of Andalucia." An abstract appears in our "Proceedings," vol. iv. p. 77.

those who, some forty years ago, rendered the literary society of Edinburgh famous, with not a few of whom he was associated as one of the founders of the Edinburgh Academy, in which he took a lifelong interest. He became a Fellow of this Society in 1822, and its Treasurer in 1838. He fulfilled the duties of the latter office in a very exemplary manner, as I can testify from personal knowledge. He devoted to it not a little of his time, and brought the finances into a better state than they had been for a long time previously. For a good many years past his health prevented him from taking his place at the evening meetings; but so long as he possibly could, he assiduously attended at council meetings, and in 1857, when he could no longer do so, he resigned his office. On that occasion he received from the Society a piece of plate as a recognition of his valuable services. His latter years were tranquilly spent at Southbank, near Edinburgh, a charming villa bequeathed to him by his uncle, General Robertson. I have very often visited him there, and found him ever cheerful and occupied, generally with literary pursuits, in which to the last he took a real pleasure. At my very latest visit I found him refreshing his recollections of the Latin Classics. He was a man of wide sympathies, and had many friends of all parties. He was a sincere Christian, and died at peace with all men. This happened on the 30th January 1862, when he had almost completed his eighty-second year. He is therefore the *fifth* octogenarian on our list, besides foreign members.

Of the remaining names on our obituary list I do not feel called on to say much. But I must mention Dr Fyfe, a highly respectable chemist, and a well-known lecturer in Edinburgh. He was at first chemical assistant to Dr Hope. In and after 1817, he lectured at the Society of Arts, and in 1844 was appointed to the Chair of Medicine in Aberdeen, having already been President, the year before, of the Royal College of Surgeons of Edinburgh. He died on the 31st December 1861, aged nearly seventy years.

Admiral NORWICH DUFF, born in 1793, was descended from the first Earl of Fife. His earlier years were spent in active service in various parts of the world. Even before he was twenty he had taken part in several great naval battles. About the time of enter-

ing this Society, in 1823, he was well known in Edinburgh, where he spent several winters, though he may be perhaps recollected by few persons now present. He married in 1833 a lady of Bath, and he died in that city in the course of last summer.

MR BURN MURDOCH and Mr. JOHN COCKBURN (brother of the late Lord Cockburn) both frequently attended our meetings, but otherwise require no detailed notice here. The former was an active agriculturist and country gentleman, and died in August last in his seventieth year.

DR JAMES RUSSELL, whose death, at the age of sixty-one, occurred only on the 21st November last, was the eldest son of Mr James Russell, Professor of Clinical Surgery, and grandson of the Professor of Natural Philosophy (also in this university), who was the predecessor of Dr Robison. Dr Russell lived a retired life, and although a physician, had not for many years practised his profession.

I have now, gentlemen, with some prolixity I fear, attempted to go over the ground which I had in view when we started. My great object has been to induce you to give a fair consideration to the claims which the objects of this really national institution—the Royal Society—has upon you, its members. I have asked you to look back to your origin,—to the constellation of eminent men who assisted at your incorporation,—to the important labours which the Transactions include,—to the social meetings which, with varying brilliancy and significance, have for eighty years connected generation with generation of the literary and scientific men of this metropolis and university-seat with one another; and I ask you to assist now, by your personal efforts, by your literary contributions if possible, at least by your attendance at our evening meetings, in adding to the interest and value of these meetings; I ask you to encourage those who labour for the promotion of original research, to maintain the credit of a society established for purposes the most disinterested and humanizing, and by so doing to justify the position which the Royal Society of Edinburgh assumes, of representing in some degree before the academies of Europe the intellect and original talent of our native country.

The following Gentlemen were duly elected Ordinary Fellows:—

ROBERT CAMPBELL, Esq., Advocate.

HUGH F. C. CLEGHORN, M.D., Conservator of Forests, Madras.

Professor BLACKIE.

The following Donations to the Library were announced:—

Ἱπποκράτους καὶ ἄλλων ἱατρῶν παλαιῶν λείψανα. Hippocratis et aliorum Medicorum veterum reliquiæ. Mandatu Academiæ regiæ disciplinarum quæ Amstelodami est. Edidit Franciscus Zacharias Ermerins. Volumen Primum. Trajecti ad Rhenum. 1859. 4to.—*From the Academy.*

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the Author.*
- Reports on the Isthmus of Krau. By Captains Fraser and Forlong,
April 1861. Folio.—*From the Authors, by Major Scott.*
- Revue Orientale et Americaine. Par Léon de Rosny. Paris. 8vo.
—*From the Author.*
- On the Probable Causes of the Earth Currents. By the Rev. H.
Lloyd, D.D. 8vo.—*From the Author.*
- Quarterly Reports of the Meteorological Society of Scotland, March
and June 1862. 8vo.—*From the Society.*
- Notice of the Angwántibo of Old Calabar. By J. A. Smith, M.D.
8vo.—*From the Author.*
- Carte Agronomique des Environs de Paris. Par M. Delesse. 8vo.
—*From the Author.*
- The Bell Rock Light-House; Letter by David Stevenson, F.R.S.E.
8vo.—*From the Author.*
- The Essentials of a Healthy Dwelling, and the Extension of its
Benefits to the Labouring Population. By Henry Roberts,
F.S.A., etc. 8vo.—*From the Author.*
- Calendar of the University of Queen's College, Kingston, Canada,
Session 1862-3. 8vo.—*From the University.*
- Annual Report of the Geological Survey of India, and of the Mu-
seum of Geology. Fifth Year, 1860-1. 8vo.—*From the Survey.*

- The Description, Composition, and Preparations of the *Sanguinaria Canadensis*, by Geo. D. Gibb, M.D., etc. 8vo.—*From the Author.*
- International Exhibition, 1862; Catalogue of the Nova Scotian Departments. 8vo.—*From the Secretary.*
- Greenwich Observations, 1860. 4to.—*From the Board of Admiralty.*
- The Quarterly Journal of the Geological Society. Nos. 69, 70, and 71. 8vo.—*From the Society.*
- Flint Implements in the Drift, being an Account of their Discovery in the Continent and in England. By John Evans, F.S.A., etc. 4to.—*From the Author.*
- Annals of the Botanical Society of Canada. Vol. I., Part. III. 4to.—*From the Society.*
- Reduction of the Observations of the Deep-sunk Thermometers at the Royal Observatory, Greenwich, from 1846-59. By Professor J. D. Everett, Nova Scotia. 4to.—*From the Author.*
- List of Fellows of, and Papers read before, the Royal Institute of British Architects, 1861-2. 4to.—*From the Institute.*
- The Theory of Probabilities, by George Boole, F.R.S. 4to.—*From the Author.*
- Abstracts of Meteorological Observations in 1860-1. Edited by Sir H. James, R.E. 4to.—*From the Editor.*
- Memoirs of the Geological Survey of India: Palæontologica Indica. Edited by Thomas Oldham, LL.D. 4to.—*From the Editor.*
- Proceedings of the Society of Antiquaries of London (with Lists). Vol. I., Nos. II.-VII. 8vo.—*From the Society.*
- Memoirs of the Royal Astronomical Society of London. Vol. XXX. 4to.—*From the Society.*
- Meteorologische Waarnemingen en Nederland en Zijne Bezittingen, etc., 1859-60. Oblong 8vo.—*From the Royal Meteorological Institute of the Netherlands.*
- Récherches sur l'Evolution des Araignées. Par M. E. Claparède. 4to.—*From the Society of Arts and Sciences at Utrecht.*
- Compte Rendu de la Commission Imperiale Archéologique pour l'Année 1860, et Atlas. S. Petersbourg. Folio.—*From the Russian Government.*

Monday, 15th December 1862.

PROFESSOR CHRISTISON, V.P., in the Chair.

The following Communications were read:—

1. On the Representative Relationships of the Fixed and Free Tunicata, regarded as two sub-classes of equivalent value; with some general remarks on their morphology. By John Denis Macdonald, Esq., R.N., F.R.S., Surgeon H.M.S. "Icarus." Communicated by Professor MacLagan.

In this paper the author maintains the proposition, that the class Tunicata may be conveniently divided into two sub-classes, viz., the Fixed or Stationary, and the Free or Locomotive, of at least nearly equal value in a zoological point of view, in opposition to the opinion commonly entertained, that the so-called Pelagic Tunicata compose a group only commensurate with the groups of the Compound, the Social and the Simple, into which the Fixed Tunicata have been divided by Milne-Edwards and others.

After some general remarks on the morphology of the class Tunicata, the author proposes the classification, of which the following are the leading subdivisions, and under which he groups and classifies the various genera of Tunicata.

TUNICATA.

Sub-class 1st.—Animals fixed or stationary.

I. Branchial membrane closely adherent, or more or less perfectly sac-like; simply areolated or distinctly retiform, the meshes disposed in many transverse series without non-ciliated supporting bars.

1. Gemmæ springing directly from the parent, with a temporary bond of union—Simple Tunicata.
2. Gemmæ springing separately from a definite "ascidiarium" (Hux.), and communicating indirectly through a central common vascular system—Social Tunicata.
3. Gemmæ arising separately from the parent with or without vascular intercommunication, but always immersed in a common test or "ascidiarium"—Compound Tunicata.

Sub-class 2d.—Animals free, locomotive.—Pelagic Tunicata.

II. Branchial membrane sac-like, with transverse slits in single longitudinal series, strengthened by longitudinal non-ciliated rods, apertures terminal or sub-terminal.

III. Respiring by an upper and a lower gill-band, connected with each other laterally, and with the walls of the atrium; having branchial slits, but no supporting longitudinal rods; apertures terminal.

IV. Respiring by a central and inferior gill-band, with free borders and transverse ciliated stripes, but without slits or rods; apertures terminal or sub-terminal.

V. Pharynx ciliated below, without a distinct gill-band; branchial slits reduced to two ciliated openings on the sides of the rectum.

The author concludes his paper with remarks on several of the genera, in reference to the position assigned to them in his classification, and with some details as to the anatomy of *Orthocala*—the *Salpa pinnata* of authors.

2. On the great Refractor at Elchies, and its powers in Sidereal Observation. By Professor C. Piazzzi Smyth, Astronomer-Royal for Scotland.

The telescope here referred to is the largest and best ever erected in Scotland, for exact sidereal observation; and the author having paid a visit last September to its liberal and hospitable owner, J. W. Grant, Esq., of Elchies, Morayshire, had an opportunity of trying its powers on double stars, and describes the results of the trial in his paper.

Out of a list of twenty-nine double stars, there were six cases where one or more new small stars were discovered; and the observations of position and distance on the older members of each group were so trustworthy, as to add valuable information towards elucidating both the proper motion of some *optical* double stars, and the orbital motion of several *binary* ones. In addition to which, several unexpected results were arrived at with reference to cosmical changes in the magnitudes and colours of certain stars.

The following Donations to the Library were laid on the Table:—

Smithsonian Miscellaneous Collections. Vols. I., II., III., and IV.

8vo.—*From the Institution.*

Thirteenth Annual Report of the Regents of the University of the State of New York on the Condition of the State Cabinet of Natural History, &c. 8vo.—*From the Regents of the University.*

Proceedings of the American Philosophical Society. Vol. VIII., Nos. 64, 65, and 66. 8vo.—*From the Society.*

Annual Report of Brevet Lieutenant-Colonel J. D. Graham on the Improvement of the Harbours of Lakes Michigan, S. Clair, Erie, Ontario, and Champlain, for the year 1860. 8vo.—*From the American Government.*

Manual of Public Libraries, Institutions, and Societies in the United States and British Provinces of North America. By William J. Rhees. 8vo.—*From the Smithsonian Institution.*

Studies in Organic Morphology. By John Warner. 8vo.—*From the Author.*

Fifteenth Annual Report of the Ohio State Board of Agriculture for the year 1860. 8vo.—*From the Ohio Board.*

Annual Report of the Board of Regents of the Smithsonian Institution for 1860. 8vo.—*From the Institution.*

Transactions of the Pathological Society of London. Vol. XIII. 8vo.—*From the Society.*

Proceedings of the Royal Horticultural Society. December 1862. 8vo.—*From the Society.*

Jahresbericht über die Fortschritte der Chemie für 1861. Besorgt von Wilhelm Hallwachs. Erste Hälfte. 8vo.—*From the Editor.*

The Quarterly Journal of the Geological Society. Vol. XVIII., No. 72, Pt. 4. (With Charter, and Bye-Laws, and List of Members.) 8vo.—*From the Society.*

On the Danger of Hasty Generalization in Geology. By Alexander Bryson, Esq., F.R.S.E. 8vo.—*From the Author.*

Report upon the Colorado River of the West; explored in 1857. and 1858 by Lieutenant Joseph C. Ives, by Order of the

- Secretary of War Royal 8vo.—*From the American Government.*
- Transactions of the Linnean Society of London. Vol. XXIII., Part Second. 4to.—*From the Society.*
- Results of Meteorological Observations made under the Direction of the United States Patent Office and the Smithsonian Institution, from the year 1854 to 1859 inclusive: being a Report of the Commissioner of Patents made at the First Session of the Thirty-Sixth Congress. Vol. I. 4to.—*From the Smithsonian Institution.*
- Nova Acta Regiæ Societatis Scientiarum Upsaliensis, seriei tertiæ Vol. IV. Fasc. 1., 1862. 4to.—*From the Society.*
- Ofversigt af Kongl. Vetenskaps—Akademiens Fördhandlingar. Adertonde Argangen. 1861. 8vo.—*From the Academy.*
- Kongliga Svenska Vetenskaps—Akademiens Handlingar. Ny Följd. Tredje Bandet. Andra Häftet. 1860. 4to.—*From the same.*
- Meteorologiska Jakttagelser Sverige utgifna af Kongl. Svenska Vetenskaps—Akademien bearbetade af Er. Edlund. Andra Bandet. 1860. 8vo.—*From the same.*
- Report on the Physics and Hydraulics of the Mississippi River; upon the protection of the Alluvial Region against Overflow, etc. Prepared by Captain Humphreys and Lieutenant Abbot. 4to.—*From the American Government.*
- Transactions of the American Philosophical Society, held at Philadelphia for Promoting Useful Knowledge. Vol. XII. New Series. Part I. 4to.—*From the Society.*
- Memoirs of the American Academy of Arts and Sciences. New Series. Vol. VIII. Part I. 4to.—*From the Society.*
- Proceedings of the above; from the Four Hundred and Ninety-Sixth to the Five Hundred and Seventh Meeting. 8vo.—*From the same.*
- Jahrbuch der kaiserlich-königlichen geologischen Reichsanstalt, 1861 and 1862. XII. Band., Nro. 3. Mai, Juni, Juli, August 1862. Wien. 8vo.—*From the Reichsanstalt.*
- Die Fossilen Mollusken des Tertiär-beckens von Wien. Von Dr Moritz Hörnes. 8vo.—*From the same.*
- Bulletin de l'Académie Impériale des Sciences de St Pétersbourg.

- Tome IV., Nos. 3, 4, 5, and 6. 8vo.—*From the Academy.*
- Mémoires de l'Académie Impériale des Sciences de St Petersburg. VII^e. Série. Tome IV., Nos. I. to IX. 8vo.—*From the same.*
- Rendiconto delle Sessioni dell' Accademia delle Scienze dell' Istituto di Bologna. Anno Accademico 1859-60, e 1860-1. 12mo.—*From the Academy.*
- Memorie dell' Accademia delle Scienze dell' Istituto di Bologna. Tomo X., Fasc. I., II., e III.; e Tomo. XI. 8vo.—*From the same.*
- Memorie del Reale Istituto Lombardo di Scienze, Lettere, ed Arti. Vol. VIII., Fasc. 7; e Vol. IX., Fasc. 1. 8vo.—*From the Institute.*
- Atti del Reale Istituto Lombardo di Scienze, Lettere, ed Arti. Vol. II., Fas. 15, 16, 17, 18, 19, e 20; e Vol. III., Fasc. 1-4.
- Forhandlinger i Videnskabs-selskabet i Christiania. Aar 1861. 8vo.—*From the Society.*
- Flateyjarbok en Samling af Norske Konge-Sagaer, etc., 1859, 1860, 1861, 1862. 8vo.—*From the Society.*
- Geologiske Undersgelser i Bergens-Omega af Th. Hiatdahl og M. Irgens. 4to.—*From the Authors.*
- Beskrivelse over Lophogaster Typicas, af Dr Michael Sars. 4to.—*From the Author.*
- Beskrivelse over Aas høiere Landbrugskole af F. A. Dahl. 4to.—*From the Author.*
- Fortegnelse over Modeller af Landhusholdnings. Redskaber fra Ladegaard sens Hovedgaard ved Christiania. 8vo.—*From the University.*
- Meteorologische Beobachtungen aufgezeichnet auf Christiania's Observatorium. Lieferung I. and II. 8vo.—*From the Observatory.*
- Det Kongelige Norske Videnskabers-Selskabs Skrifter 1det 19de Aarhundrede. 4de Binds 2det Hefte. Drontheim. 8vo.—*From the Society.*
- Det Svenske Under visningsvaesen. 8vo.
- Index Scholarum in Universitate Regia Fredericiana nonagesimo octavo ejus semestri anno MDCCCLII. XVII. Kalendas Februarias habendarum. 8vo.—*From the University.*

Index Scholarum in Universitate Regia Fredericiana nonagesimo nono ejus semestri anno MDCCCLII ab Augusto Mense ineunte habendarum. 8vo.—*From the same.*

Er Norsk det Samme som Dansk? Af K. Knudsen. 8vo.—*From the Author.*

Ueber das Frictions-Phänomen von Herrn Theodore Kjerulf in Christiania. 8vo.—*From the Author.*

Beretning om Fiskeri-udstillingen i Amsterdam 1861.—*From the University of Christiania.*

Beretning om det kongelige Selskab for Norges Vel, etc. i. Aaret 1861. 8vo.—*From the same.*

Syphilisationen udført i Drammens Sygehuns. Ved Stadslæge F. C. Wildhagen. 8vo.—*From the Author.*

Fortsatte Observationer om Syphilisationem von Prof. W. Boeck. 8vo.—*From the Author.*

La Norvège Pittoresque. Recueil de Vues. Oblong 8vo.—*From the University of Christiania.*

Norges Mynter i Middelalderen, samlede og beskrevne af C. J. Schive. Folio.—*From the same.*

Die Culturpflanzen Norwegens beobachtet von Dr F. C. Schübeler, etc. 8vo.—*From the same.*

Geographical Charts.—*From the same.*

Recherches sur la Syphilis. Folio. Par W. Boeck.—*From the same.*

Monthly Notices of the Royal Astronomical Society. Vol. XXIII., No. 1. 8vo.—*From the Society.*

Journal of the Chemical Society, December 1862.—*From the Society.*

Monthly Return of the Births, Deaths, and Marriages, Registered in the Eight Principal Towns of Scotland, November 1862.—*From the Registrar-General.*

